

For more detailed installation, configuration, programming, file transfer, and operating instructions, refer to the *NetLinx Integrated Controllers Instruction Manual*, available on-line at [www.amx.com](http://www.amx.com).



**FIG. 1** NI-700 NetLinx Integrated Controller (front and rear views)

### Overview

The NI-700 unit (**FG2105-03**) is geared to meet the specific control and automation needs of a single room environment, where both price and functionality are the driving requirement. This product is configured to control a limited number of video players, projectors, lighting, thermostats, and other electronic equipment. The NI-700 provides support for **1 IR/Serial Output port**, **2 RS-232/RS-422/RS-485 ports**, **4 Digital Input/Output ports**, and **1 IR RX port**.

### ATTENTION!

*When working with the NI-700 Integrated Controller, verify you are using the latest version of NetLinx Studio v 2.2 build 78 or higher (available for download from [www.amx.com](http://www.amx.com)).*

### NI-700 Specifications

Dimensions (HWD):	<ul style="list-style-type: none"> <li>1.58" x 5.54" x 5.12" (4.01 cm x 14.10 cm x 13.00 cm)</li> <li>1 rack unit high</li> </ul>
Power:	<ul style="list-style-type: none"> <li>280 mA @ 12 VDC</li> </ul>
Memory:	<ul style="list-style-type: none"> <li>32 MB SDRAM</li> <li>16 MB Flash chip</li> <li>512 Kb of Non-volatile SRAM</li> <li>Refer to the <i>NetLinx Integrated Controllers Instruction Manual</i> for more information.</li> </ul>
Microprocessor:	<ul style="list-style-type: none"> <li>304 MIPS using a PowerPC™ processor</li> </ul>
Weight:	<ul style="list-style-type: none"> <li>1.30 lbs (0.59 kg)</li> </ul>
Enclosure:	<ul style="list-style-type: none"> <li>Metal with black matte finish</li> </ul>
Front Panel:	<ul style="list-style-type: none"> <li>Program Port: RS-232 DB9 connector (male) can be connected to a DB9 port on a PC. This port can be used with both Serial and NetLinx commands.</li> <li>Configuration DIP Switch: Use this DIP switch to set the communication parameters for the Program port.</li> <li>IR RX LED: Red LED lights to indicate when IR data is being received via the rear IR RX port.</li> <li>IR LED: Red LED lights to indicate transmission of IR or Serial data via the rear IR port.</li> <li>I/O LEDs: Four yellow LEDs light when the rear I/O channels 1-4 are active. LED indicator for each I/O port reflects the state of that particular port.</li> <li>Serial LEDs: Two sets of red and yellow LEDs light to indicate the rear DB9 Ports 1 &amp; 2 are transmitting or receiving RS-232, 422, or 485 data. These LEDs do not reflect changes in either the RTS or CTS when hardware handshaking is used.</li> <li>LINK/ACT: Green LED lights when the Ethernet cable is connected and an active link is established. This LED also blinks when receiving Ethernet data packets.</li> <li>Status: Green LED lights to indicate that the system is programmed and communicating properly.</li> <li>Output: Red LED lights when the Controller transmits data, sets channels On and Off, sends data strings, etc.</li> <li>Input: Yellow LED lights when the Controller receives data from button pushes, strings, commands, channel levels, etc.</li> <li>ID Pushbutton: Sets the NetLinx ID (<b>Device only</b>) assignment for the device.</li> </ul>

### NI-700 Specifications (Cont.)

Rear Panel:	<ul style="list-style-type: none"> <li>RS-232/422/485 (<b>Ports 1 &amp; 2</b>): Two RS-232/422/485 control ports using DB9 (male) connectors with XON/XOFF (transmit on/transmit off), CTS/RTS (clear to send/ready to send), and 300-115,200 baud.</li> <li>IR RX (<b>Port 5</b>): This single port is used to connect one or more (8 maximum) IRX-SM+ swivel mount or IRX-DM+ Decora mount IR receivers. <i>The IR RX port functions using AMX IR codes (38 KHz and 455 KHz) and works ONLY with AMX IR Receivers such as the IRX-DM+ and IRX-SM+.</i></li> <li>Digital I/O (<b>Port 4</b>): Four-channel binary I/O port for contact closure with each input being capable of voltage sensing. Input format is software selectable with interactive power sensing for IR ports.</li> <li>IR/Serial (<b>Port 3</b>): This single port is capable of generating IR with the use of an IR emitter (<i>while in IR mode</i>). <i>This port can support high-frequency carriers of up to 1.142 MHz and can also generate IR with no carrier frequency.</i></li> <li>AXlink LED: One green LED indicates the state of the AXlink port.</li> <li>AXlink port: 4-pin 3.5 mm mini-Phoenix (male) connector provides data and power to external control devices.</li> <li>Ethernet port: LEDs show communication activity, connections, speeds, and mode information: <i>L/A-link/activity</i> - Green LED lights On when the Ethernet cables are connected and terminated correctly and blinks when receiving Ethernet data packets. <i>SPD-speed</i> - Yellow LED lights On when the connection speed is 100 Mbps and turns Off when the speed is 10 Mbps.</li> <li>Power port: 2-pin 3.5 mm mini-Phoenix (male) connector</li> </ul>
Included Accessories:	<ul style="list-style-type: none"> <li>NI-700 Quick Start Guide (93-2105-03)</li> <li>One 6-pin 3.5 mm mini-Phoenix female I/O connector (41-5063)</li> <li>One 4-pin 3.5 mm mini-Phoenix female AXlink connector (41-5047)</li> <li>One 2-pin 3.5 mm mini-Phoenix female PWR connector (41-5025)</li> <li>One CC-NIRC IR Emitter (<b>FG10-000-11</b>)</li> <li>OpenSSL Warranty and Licensing Information (93-2105-05)</li> </ul>
Optional Accessories:	<ul style="list-style-type: none"> <li>2-pin Black Male Phoenix Connector (3.5mm) (41-5026)</li> <li>AC-RK Accessory Rack Kit (<b>FG515</b>)</li> <li>CC-NIRC IR cables (<b>FG10-000-11</b>)</li> <li>CC-NSER IR/Serial cables (<b>FG10-007-10</b>)</li> <li>CSB Cable Support Bracket (<b>FG517</b>)</li> <li>PSN2.8: Power supply (<b>FG423-17</b>)</li> <li>PSN4.4: Power supply(<b>FG423-45</b>)</li> <li>PSN6.5: Power supply (<b>FG423-41</b>)</li> <li>STS, Serial To Screw Terminal (<b>FG959</b>)</li> <li>Surface Mount Bracket Accessory (<b>FG525</b>)</li> </ul>

### Port Assignment and Functionality

#### NetLinx Port Assignments

Port	ICSP Port #
Serial Port 1	1
Serial Port 2	2
IR Port	3
I/O Port	4
IR RX Port	5

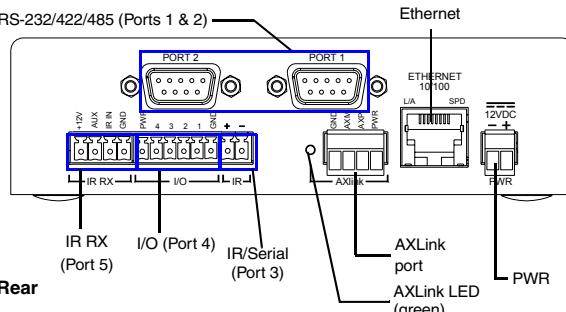
### Ethernet Ports used by the NI Controller

#### Ethernet Port Usage

Port type	Description	Standard Port #
ICSP	Peer-to-peer protocol used for both Master-to-Master and Master-to-device communications.	1319 (UDP/TCP)
Telnet	The NetLinx Telnet server provides a mechanism to configure and diagnose a NetLinx system.	23 (TCP)
HTTP	The Master has a built-in web server that complies with the HTTP 1.0 specification and supports all of the required features of HTTP v1.1.	80 (TCP)
HTTPS	The Master has a built-in SSL protected web server.	443 (TCP)
FTP	The on-board Master has a built-in FTP server that conforms to RFC959.	21/20 (TCP)
Internet Inside	The Internet Inside feature the Master uses, by default, is port 10500 for the XML based communication protocol. This port is connected to by the client web browser's JVM when Internet Inside control pages are retrieved from the on-board Master's web server.	10500 (TCP)

## Connections and Wiring

FIG. 2 shows the layout of the connectors and components located on the rear of the NI-700 NetLinx Integrated Controller.



**FIG. 2** NI-700 rear connectors and components

### Wiring a power connection

Use any standard PSN power supply (usage dependent) to supply power to the NI-700 through the 2-pin 3.5 mm mini-Phoenix connector on the rear panel (FIG. 2).

The incoming PWR and GND cable from the PSN power supply must be connected to the corresponding locations within the PWR connector. Refer to the *NetLinx Integrated Controllers Instruction Manual* for more detailed wiring connection information.

### RS-232/422/485 wiring connector information

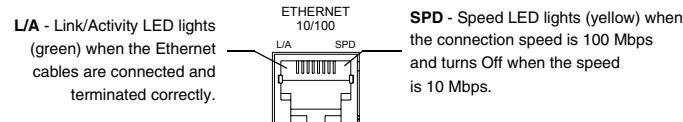
FIG. 3 shows the pinout and wiring specification information for the rear RS-232/RS-422/RS-485 (DB9) Device Ports. These ports support most standard RS-232 communication protocols for data transmission (NI-700 uses Ports 1 & 2).

DB9 Serial Port pinouts (male connector)		
RS-232	RS-422	RS-485
Pin 2: RX signal	Pin 1: RX -	Pin 1: A (strap to 9)
Pin 3: TX signal	Pin 4: TX +	Pin 4: B (strap to 6)
Pin 5: GND	Pin 5: GND	Pin 5: GND
Pin 7: RTS	Pin 6: RX +	Pin 6: B (strap to 4)
Pin 8: CTS	Pin 9: TX -	Pin 9: A (strap to 1)

**FIG. 3** RS-232/422/485 DB9 (male) connector pinouts

### Ethernet 10/100 Base-T Connector

A standard CAT5 Ethernet cable provides 10/100 network connectivity between the Integrated Controller and the network (FIG. 4).



**FIG. 4** Layout of Ethernet LEDs

**Note:** On NetLinx Masters (such as those aboard the NI-700), from within the Telnet or Terminal applications; you can send the **SET ETHERNET MODE** command to assign the speed of your Ethernet connection.

Sample NI-700 command:

```
SET ETHERNET MODE AUTO
```

**The NI-700 only allows you to set the Ethernet mode to AUTO negotiate the Ethernet connection speed. Using any of the other connection modes (10 Half/Full or 100 Half/Full) results in an error message.**

### Program Port Baud Rate Settings

The Configuration DIP switch is located on the front panel. Use this DIP switch to set the baud rate for the Program Port, according to the settings shown in the following table. Make sure the baud rate you set matches the baud rate on your PC's NetLinx COM Settings before programming the unit.

**By default, the baud rate is set to 38,400 (bps).**

### Baud Rate Settings

Baud Rate	Position 5	Position 6	Position 7	Position 8
9600 bps	OFF	ON	OFF	ON
38,400 bps (default)	OFF	ON	ON	ON
57,600 bps	ON	OFF	OFF	OFF
115,200 bps	ON	ON	ON	ON

**Note:** DIP switch 1 activates/deactivates the Program Run Disable Mode. DIP Switches 2,3, and 4 must remain OFF at all times.

### Setting the Configuration (Program Port) DIP Switch

1. Disconnect the power supply from the rear 2-pin PWR (green) connector.
2. Set DIP switch positions according to the information listed in the previous Baud Rate Settings table.
3. Reapply power to the unit.

### Preparing the NI-700 for Communication

1. Launch NetLinx Studio 2.2 (default location is **Start > Programs > AMX Control Disc > NetLinx Studio > NetLinx Studio 2.2**).
2. Select **Settings > Master Communication Settings**, from the Main menu, to open the *Master Communication Settings* dialog box.
3. Click the **Communications Settings** button to open the *Communications Settings* dialog.
4. Click the **NetLinx Master** radio button (from the Platform Selection section) to indicate that you are working with a NetLinx Master (NI-Series of Integrated Controllers).
5. Click the **Serial radio** button (from the Transport Connection Option section) to indicate you are connecting to the Master via a COM port.
6. Click the **Edit Settings** button (on the *Communications Settings* dialog) to open the Serial Settings dialog and set the COM port parameters for the COM port being used to communicate to the NetLinx Master.
7. Click the **OK** button three times to return to the main application.
8. Right-click within the **Online** tab and select **Refresh System**.
9. Assign a System Value by using **Diagnostics > Device Addressing** from the Main menu and enter the new and current system values.
10. Click the **Change Device/System Number** button and when finished click **Done**.
11. Select **Tools > Reboot the Master Controller > Continue** to restart the Master and incorporate any changes.

### Communicating with the Integrated Controller via Ethernet

Once the NI-700 has been configured according to the steps outlined above, it is ready for Ethernet communication:

1. Connect an Ethernet cable to the units' rear Ethernet connector.
2. Select **Diagnostics > Network Address** from the Main menu and either use the:
  - **GET IP** button (to obtain a DHCP Address from the DHCP Server), click **SET IP** to assign the new address and then press the **Done** button to finish the process.
  - **SET IP** button (to set/specify a pre-reserved IP Address to the Master), click this button and then press the **Reboot Master** button to restart the Master and incorporate any changes.
3. Repeat steps 2 - 4 from the above section.
4. Click the **TCP/IP radio** button (from the Transport Connection Option section) to indicate you are connecting to the Master via an IP.
5. Click the **Settings** button.
6. Enter the TCP/IP Address (either the obtain or assigned address) from step 2.
7. Click the **OK** button three times.
8. Right-click within the Online Tree tab and select **Refresh System**.